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## **NEW PRODUCT DEVELOPMENT IN GLOBALIZATION ERA**

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### **ABSTRACT**

*Currently, new product development is important in order for firms to grow and successful. Successful new product development is essential for any business if it hopes to exist continuously. Globalization effect which increases competition, cost cutting and time reduction has been pressing industrial players to undertake a structured way to improve the process effectively. Therefore, many companies invested a huge of capital in defining a product line demand that can be translated into the market demand and needs. However, many new product development projects failed where many new products which were introduced into the market does not run successfully as planned. The reason is it does not meet customers' expectation despite all the effort. Hence, this conceptual paper is about the discussion of the new product development in globalization era. It will affect the influence of technology and innovation in new product development. A review of the literature on product lifecycle, new product development, technology and innovation along with new product development theories discussed in this paper. This paper expected to gives significant contribution in understanding customers' needs and wants so that industry practices to focus resources in promote technology and innovation in new product development which more likely to be accepted by customers.*

**Keywords:** *Technology, Innovation, New product development, Quality, Customers*

### **INTRODUCTION**

Looking back to history of economy development, Malaysia also known for its agro based sector such as crude oil, rubber, timber and fiber. These raw materials were processed for consumption for the people and for exportation. The exportation of these processed raw materials generates revenue that used to drive economic growth and strengthen the fiscal position which build and develop the nation. However, it is not massive compare to the manufacturing sector. Availability of the manufacturing sector can boost further development to the people by enriching their lives, providing prosperity, wellbeing and building a better Malaysia for all Malaysians.

The Malaysian Government is committed to grow the industrial sector in this country. With this concern, in 1971, the 'New Economic Policy' was introduced. This is in line with the Government of Malaysia's agenda to improve people's welfare and restructure ethnic economic imbalances. Vision 2020 which was announced by Tun Dr. Mahathir

Mohamad, in 1991, underlined nine challenges that Malaysia must overcome in order to be developed country.

The financial crisis which was strike in the year 2007 to 2010 has changed the global conditions. To address the changes, our current Prime Minister Yang Amat Berhormat Najib Tun Razak has implemented various policies and strategies. The Second industrial Master Plan (IMP2) which was ended in 2005, aimed to increase the total number of SMEs in the country. The introduction of the Third Industrial Master Plan (IMP3) which started in 2006 and will be ending 2020, aiming to enhance the growth of the manufacturing sector by implementing various initiatives and strategies.

The Eleventh Malaysia Plan (11MP), which is from the year 2016 to 2020 together with Industrial Master Plan (IMP3) is the final leg in the journey towards realizing Vision 2020. The Malaysian National Development Strategy (MyNDS) is guiding the development of the Eleventh Malaysia Plan. This plan is focuses on capital and people economies. Gross Domestic Product (GDP) growth, big businesses, large size of investment projects and financial markets are referred to capital economies. People economies are including jobs, small businesses, the cost of living, family wellbeing and social inclusion. This initiative offers a great opportunity to explore the development and enhance the growth of manufacturing sector.

In addition, ASEAN Economic Community (AEC) which was implemented in 2015, offering a golden opportunity for Malaysia to benefit from this significant initiative. AEC is a regional platform where 10 member countries of ASEAN such as Myanmar, Vietnam, Thailand, Malaysia, Singapore, Indonesia, Laos, Philippines, Cambodia and Brunei Darussalam thrives their strengths to grab this tremendous opportunity to excel and blossom in trading their products within an open market system. This platform will help manufacturing industry provide jobs that boost productivity to drive high rate of economic growth.

Other than that, in the changing global economy condition, the influence of technology and innovation in new product development has become a central issue for manufacturing industry. At such, providing maximum value to customers and gaining competitive advantage are becoming current changing trend in todays' business environment (Sergio Terzi et al, 2010)

To sum up, in today's fiercely competitive world, the influence of technology, market structure, global scope and vertical integration have been rapidly changing the world of commercial (Christensen C.M, 1997). The success and failure of a firm will be determined simply by how fast, flexible and innovative a firm reacts to the changes. However, it is quite challenging and might be a nightmare for managers to understand the cause and effect of any changes. These changes might be offer opportunity to the firm to succeed or will turn as threat that even great firms fail.

The objective of this paper is to identify the influence of technology and innovation in new product development that shaping the industry to survive. So, with regard to globalization, scarce resources, time to market and borderless challenges, the discussion

is very closely related to understanding the influence of product lifecycle, new product development, technology and innovation.

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## **PRODUCT LIFECYCLE**

It is essential to understand the term of 'product'. Practitioners and scholars have been defined product in several ways. According to dictionary search, product defined as a thing produced by labor; products of farm and factory; a person or thing produced by or resulting from a process; result; the totality of goods or services that a company make available; output. The word product is originated from the Latin word 'productum', meaning (thing) produced. It is believed that the word has been starting in practice during the year of 1400 to 1450.

In recent years, we have been witnessing a rise in customer expectations with respect to the products offered. One of the most significant current discussions in the industry is product lifecycle. Product lifecycle continue to shorten and new product development efforts become increasingly crucial. Consequently, to keep up with current situation, the improvement of cost, quality and time to market in the new product development considered the important game changer to remain competitive and sustainable in the marketplace.

According to Terzi et al (2010), the product lifecycle starts from design, manufacture, distribution, use, support, maintenance, repair, recycle and finally disposal. As for today's business environment, information regarding product competences and performance are shared among various parties. Moreover, managing and understanding product lifecycle enable organization to strategies their business strategy to create market share and sustaining in the business. Bringing together products, services, activities, processes, people, skills, data, knowledge, techniques, practices and standards involved into one study called as product lifecycle management (Stark, 2005).

Kiritsis et al (2003) mention, there are three main phases separating product lifecycle. The first phase is Beginning of Life (BOL). In this phase, design and manufacturing takes place. At the design process, functions such as identifying requirements, concepts, and elaborations on design, prototyping and performing tests will be carried out. Meanwhile, in the manufacturing process, planning and arranging the production, structuring operations together with internal plant logistics to produce product that had been designed. During this phase, the product is still within the organization and organization able to control the movement process.



new product to the market. New Product development involves either improving an existing product, design, or its outlook or developing a new product to target a particular market segment.

Continuing new product development is necessary and important in today's world for companies in striving to keep up with changes, demands and trends in the marketplace to ensure their future profitability, competitive advantages and success (Shuba et al, 2008). In order to win customer's heart by quickly develop exciting and catchy products, new product development aspect become a critical and crucial to many firms.

New Product development is a potential source of competitive advantage and opportunity where if a firm able to come up with high quality product at low cost. By addressing the customer needs, firm able to success, survive and become top player in its industry (Brown et al, 1995). According to Shuba et al (2008), pioneering in product innovation and market investment on creating value to their product will help to lift firm's stock return significantly. According to them, the positive impact of the product on customer perspective will enhance and accelerate the future cash flow which will improvise their expected financial performance in long run. The increase involvement on top management in the product development not only supported but also will be boost to the economic.

In the context, customer also played an important and active role in new product development. Technology has provided customer unlimited access of information and gave a greater role to decide how the product shall fulfill their needs. The product that enters a market has to possess quality, reduce risk and increase market acceptance (Business Wire, 2001). However due to strong intermediaries such as retailer, potential customer and changing customer preferences very often failed to match the customer's requirement. As such, high investment needed to pump in order to start product development processes (Wayne et al, 2010).

In addition to that, green product innovation also affects the market demand. Green product innovation according to Pujari (2006) illustrated that it is an opportunity for industry to boost its product and increase its market share. Empirical studies have also showed there is positive relationship between product innovation and firm performance. Green product innovation provide important medium where it address environmental issues and also improvise firm's operation and lead to the introduction of new improvised product (Pujari, 2006).

According to Dangelico and Pontrandolfo (2010), development in the green product innovation is effectively increasing the awareness and this influence the firm to practice green product innovation in their operation and production to gain competitive advantages with its competitors. In order to maintain the competitive advantage, it is essential for firm to develop the product development more emphasizing in green where it will improving the firm's productivity and achieving more market share.

Manufacturing industry not only come up with product and the associated activities but it also building wealth and generating employment throughout the whole economy (Yoram, 2010). In other meaning, manufacturing industry creates opportunity and support living to the people and enabling other supporting sector to exist such as transportation, information and communication. However, a range of potentially detrimental effects such as depletion of material and resources, the ecosystem effect and impact on greenhouse gas emission recognized as negative effects that surrounding the growth of industry (Zhao et al., 2017).

Subsequently, high demand towards productivity in manufacturing industry and keeping up with the economic development, the use of technology is needed in managing the changes.

## **TECHNOLOGY**

According to Christensen (1997), changes in technology and its market structure have make manager to understand and update themselves in order to keep up the changes. The view of the technology revealed that even great and leading companies will failed if they did not follow the changes.

With technology, an industry can sustain its performance in its product and able to capture high market share in its market. Meanwhile, on the contrary although company redefined its product and performance, it consistency resulted in failure. The usage and effect of the technology on the industry have sustained a company's product performance and also improve its features to the expectation of customer (Christensen, 1997).

Jie Wu (2011) mention technology collaboration on the product innovation worked together hand to hand. In the highly competitive market, strategy needed to be determined and those strategies provide robust support to the product development. Jie Wu (2011) stated data that derived from the product innovation contribute to the technological collaboration.

Manufacturing industries face fierce global competition on the quality of their products. As such, firm that would be outstanding among its competitors and fulfilling the quality requirement, they required to shift or relocate their operation and production facilities in countries that have cheaper labor cost. Relocation decision made due to higher labor cost in currently operating country. However by relocating the operation and production facilities in other countries incur more capital expenditure. Studies also showed customers are not happy if firm shift the additional cost to their pocket and not willing to purchase higher price for the quality products. As a result, many manufacturing industry focuses on more customized products that leverage their costs.

As such, innovation helps in customizing products, creating job opportunities and improving infrastructure. Support from manufacturing industry is required to ensure the new product development has a positive impact.

## **INNOVATION**

Innovation is described as a process of solving problems that emerge in the workplace. Workers develop new tools and generate their new own capital equipment in order to solve problem and better ways to operate (Omar & Lewrick, 2010). According to Pierre and Bronwyn (2013), to have better prosperity in economic, organization should invest in innovation. Innovation had direct impact on the production, hence factors such as investment increases, land usage, reduce unemployment and increase the labour force usage have to be emphasized and should be considered in order to achieve higher productivity. According to them, R&D itself not sufficient to develop product but there have to be another aspect such as Innovation Expenditure which has to be handled effectively.

Expenditure such as acquiring machinery, equipment and software that can generate new products and processes, obtaining license of patents, training associate to the product are categorized as Innovation Expenditure. Introduction of a product that is new and improvised is called product. A process innovation is a process where implementing a new and improvised product innovation (Pierre and Bronwyn, 2013).

Stephen and Nathan (1986) pointed out that innovation is a new process of production, an alternative of cheaper and newly developed material, the reorganization of production, internal function, or distribution arrangements which resulting increased efficiency, better support, lower cost or an improvement in instrument or methods of doing.

The integrated of excellent product innovation has been effectively contribute to the wellness of the firm. Throughout the product innovation process, the outcomes of the new product have been better and acceptable (Patricia et al, 2010). Customers hold an important role to the contribution of the product development which leads to higher degree of innovation, reduced innovation risks and reduce resource wastage. Customer's specialized knowledge and their preferences on their need that provide satisfaction able generate true value added to the product and also to customer itself (Von Hippel, 1977, 1988). According to Von Hippel (1977), the contribution of ideas by customer can be used into R&D and develop product that suit their needs. Effectively using customer contribution and ideas are able to close the gap that leads to improvised product (Patricia et al, 2010).

One of the factors that increasingly differentiate a firm's approach to another is innovation. Innovation in other term called as open business model. According to Henry (2007), innovation becomes an important tool which had been used to develop ideas and be partner with another firm to commercialize the ideas. For example, one firm had ideas to improvised the product but unable to venture it in the market as it might be lacking with technology expertise, labor or R&D capabilities. But with the innovation which it had open business model where it outsourced or give licensing its ideas with another firm

to develop the ideas which in return give positive impact. By doing so, it allowed external source of technology and R&D to develop and improvised it. As a result, when the developed product enters the market, it is able to sustain and unlock potential growth and earning which these firms enjoys competitive advantage by being the pioneer.

Open business model also help firms to create value to their ideas but also allow them to utilize their assets and resources to the better position but also directly shared the benefit with other player's operation and performance. The open business model allow ideas travel from one firm to another which permit them to make monetary gain and unlock a better potential earning in future (Henry, 2007).

According to Holger (2010), by innovation, firm able to fulfill its "dual role" in which it support new product development and also managing or minimizing overall costs. Studies suggested that there are four important reasons for the switch happen from closed innovation model to an open innovation model. There are increasing of labor mobility, venture capital, ideas which not utilized and developed and suppliers' capabilities (Henry, 2007). In the ever changing preferences and needs by customers, suppliers playing an important role for the firm to gather information and knowledge on how the customer view the products in which suppliers are equally important as customers.

Innovation contributes to the improvement of the quality of product. For example, healthy foods, green products and environmental issues have led to increase of awareness of organic farming practices. The food choices for organic food products have been the increased as the consumer change their preferences including organic rice (Aini et al, 2003). For example, Malaysian Organic (myOrganic) certification is obtained by implementation of standard technology which can produces high quality organic rice and facilitates best customer services (Othman et al, 2017).

## **NEW PRODUCT DEVELOPMENT THEORIES**

Kurt & Hinterhuber (1998) explained many new product development projects to meet customers' expectations in introducing products that fulfilling or solving their requirements failed as it is not establish a sustainable competitive advantage. Many resources in terms of monetary, human capital and so on are wasted because lack of communication between departments involved in the process. Unsystematic approaches in the product development process have created unnecessary waste in time where the product failed to place in the market at the right time. Failure to market the product in time has a greatest influence in losing customers.

A systematic and practical step-by-step methods needs in order managers to have clear understanding on customers' needs and requirements. Within the product development process, the input from customers and mangers together with enhanced procedures and processes increasingly required and important.



Throughout the world, customer satisfaction becomes a very important agenda among many leading companies where the performance of the product enabling them to be competitive advantage (Kurt et al, 1998). Companies are using satisfaction rating to indicate the loyalty of their customers which lead the fate and future of the company. Achieving high level of loyalty will increase the product sales and will decrease cost of attracting new customers.

Willingness for the customer to pay more and frequent purchasing of the product will only happen when the product exceeded the expectation. If the product exceeded the expectation of the customers, it will motivate and drive the customers to continually do business with the company. As such, the ultimate goal for every company in the market is to exceeding customer's expectation and satisfactory (Kurt et al, 1998).

According to Kurt (1998), the product development project has seven step-by-step approaches as follows, i) identifying customer needs, ii) structuring the needs and prioritizing them (Must-Be requirements, One-Dimensional requirements and Attractive requirements are structured into a hierarchy), iii) comparing customers' perceptions, iv) identifying design attributes (engineering the product development), v) developing the relationship matrix (judging how the strong design attributes influence customer needs), vi) developing the roof matrix and lastly vii) estimate of costs, feasibility and technical difficulty.

Model Kano et al (1984) elaborate 'Must-Be', 'One-Dimensional' and 'Attractive' requirements have greatest influence on fulfilling product quality and subsequently on the customer's level of satisfaction. Fulfilling the basic criteria is the 'Must-Be' requirement. Meanwhile, the 'One-Dimensional' requirement means the higher or better the level of fulfillment, the higher the customer satisfaction and vice versa. Exceeding customer expectation and provide a value enhanced product or service is refer as 'Attractive' requirement. Kano's model underlying a concept that it is important and focus on prioritizing the 'One-Dimensional' and 'Attractive' requirements as they have greater influence on quality of the product.

In addition, Japanese manufacturers are the first successful user of Quality Function Deployment (QFD) before the American and European manufacturers in the product development projects (Akao, 1992). Electronics, home appliances, clothing, synthetic rubber, construction equipment and agriculture engines are the sectors that Japanese manufacturers implemented the QFD. QFD is a customer-oriented approach which it helps to make key identification what the customers want and what the company afford to build.

Furthermore, Morgan and Liker (2006) Toyota has developed their own product development system where it has reduced their lead-time to 12 to 15 months compared with 24 months in North America. Toyota Product Development System (TPDS) has illustrates 13 principles that responsible in minimizing cost and time. There are i) separating value added from waste by establishing customer-defined value, ii) exploring solution in product design process, iii) creating a product development process flow, iv) creating outcome that are flexible and predictable by using rigorous standardization to

reduce variation, v) integrate product development from start to finish by developing a chief engineer system, vi) functional expertise and cross-functional are integrated and balanced, vii) all engineers are required to develop their technical knowledge, viii) suppliers are fully integrated in product development system, ix) establishing learning and continuous improvement, x) make it a culture to support excellence and stimulates continuous improvement, xi) technology that fit to their people and processes are adapted, xii) simple visual communication is used to align with the organization and lastly xiii) standardizing the organizational learning by using powerful tools.

It is clearly stated that Wayne et al (2010), agreed co-creation with consumer in new product development offer sustainable competitive advantage over the competitors as integrating consumer into the innovation process improve the result of the product quality, reduces risk and increase market acceptance.

## **DISCUSSIONS**

Once a product entered the global economy, it was easily duplicated by its competitors. It still unable to maintain its differentiation even the product had been improvised. In order to added value to their product, it is essential for firm to add value in term of services offering. The discussion will be covering two parts, namely the product lifecycle case in Koperasi ABC as a scenario in new product development and new product development in globalization era.

### **Part 1: Product Life Cycle: Case in Koperasi ABC**

Koperasi ABC is a farmer's cooperative established to help rural paddy farmers in Kedah region. The main responsibility of the cooperative is to manage innovative organic paddy farming activities. The cooperative was initially supported by the Kedah Development Agency (KEDA), a federal agency to develop rural communities in Kedah. Since its establishment in 2009, the cooperative has become a platform for farmers to practise sustainable paddy farming.

The cooperative needs to manage all documentation between the cooperative and stakeholders (other agency and institutional parties), especially the pertinent documentation prepared for the Ministry of Agriculture and Agro-Based Industry Malaysia in order to maintain the Malaysian Organic Certification. As a producer of organic products, this certification is very important to the cooperative as quality standard.

However, due to unsystematic several records keeping, the chairman of Koperasi ABC is faced with many problems and challenges. The main issue is related to the monthly evaluation by the Crop Quality Control Division, the Department of Agriculture under the Ministry of Agriculture and Agro-Based Industry Malaysia. This Division is

responsible in maintaining their quality certification. Without a systematic record keeping method related to filing for organic management, specifically for the purchases record, it is difficult for the cooperative to maintain its quality status. So, the cooperative shift to the technology to support their activities.

The chairman of Koperasi ABC identified an electronic filing system as a new product development requirement to solve this issue. Therefore, Beginning of Life (BOL) initiated by enabling an electronic filing system in Koperasi ABC based on the product lifecycle. Functionability, requirements and concepts of the electronic filing system will be developed under the 'design' process. Subsequently, the process will continue and a prototype of a system created for testing before implement process takes place.

## **Part 2: New Product Development in Globalization Era**

Recent studies had indicated that products without services added to its offering, the acceptance level in the global market unable to go further, sustain and compete with many competitors existing products (Ivanka and Bart, 2013). However, studies that conducted with the co-operation with Atlas Copco, a global manufacturer of durable industrial equipment proved that with product equip with service enable them to excel and be a competitor advantage at their worldwide network (Ivanka & Bart, 2013).

Shuba et al (2008) also suggest managerial decision played an important role in product development. Studies suggests in order to lead and able to have competitive advantage products, product has to be developed in which it is hard to copy by its competitors. However in order to do that, top management has to come up with resources such as in term of monetary, labour, machinery and technology.

In order firm to compete with their competitors, they have to build awareness to its potential customer. Firm has to spend in the advertising to build awareness among potential customer and it will accelerate the sales of its new developed products. They also suggested in order to effectively marketing their new developed product, it is very essential for firm to invest in its brand through advertising (Shuba et al, 2008). This will help to differentiate the new developed product which backed with its brand. This will lead to monopolistic power. As a result, it will increase the sales and also the earnings of the future as for competitor; it will take time for them to overcome the monopolistic power (Srivastava et al, 1998). A company-wide commitment needed in creating competitive product that fulfill customer's needs by formulating product development strategy. The initiative to start product development should include high-quality, low-cost, speed or flexibility and that offer some form of differentiation which lead a desirable purchase.

According to Christoph and Raphael (2009), a firm that want to decide what business modal design they needed, they have to analysis which the activity that enables the firm in terms of create value to its and its' partners. Top management also decides how they want to direct their resources and capabilities involved to perform the activities with the

present of their partners, suppliers or customers. Top management had to analysis the implication of the decision of choosing best business model design which it ties with the capital expenditure and fulfilling customer's needs where it can generate profit for the firm and its' chosen partner.

Designing a best business model that can fit in the future perhaps the most difficult and crucial decision that the top management need to decide. Once the decision and objectives are made and set to implemented, it will be very difficult for management to change due to the present of element resistance to change (Christoph and Raphael, 2009).

According to Yoram (2010), globalization played an important role in shaping products and manufacturing industry. Effectively integrating and interdependent with the world markets and with using all the resources available in producing goods and services that fulfill customer's need is called globalization.

Globalization created a new platform for manufacturing industry to unlock growth and wealth creation. However, globalization also creates unpredictable environment, fierce competition, limited market opportunity, frequently product introduction and high level of changes in product demand. Usually for a firm to success and able to sustain its business in globalization environment, it is required to respond quickly to the changing markets and customer's needs. At the same time, the product has to be innovative and made an appeal and different to customers that from different cultural and background. In order to do that, manufacturing need to have manufacturing systems which cater for changing demand. These manufacturing systems respond quickly to the rapid changing demand and fulfill customer's needs (Yoram, 2010).

To sum up, product in manufacturing must have differentiation and improved features that other market players do not able to copied and the added value equip with service enable a firm to capture the acceptable level in global market (Ivanka and Bart, 2013; Yoram, 2010), however Shuba et al (2008) argue awareness among potential customers is most important to accelerate the sales. A good marketing plan and advertising require resources that top management have to invest in order to build its brand that gives management a monopolistic power. This justification was support by Christoph and Raphael (2009).

## **CONCLUSION**

Today, Malaysians are better educated with 27 per cent of the labor having a degree level qualification. The connectivity such as extensive roads, rails and air networks are improved tremendously. In 2016, the International Institute for Management Development has announced Malaysia was rated as 19<sup>th</sup> most competitive county among 60 countries in the world. Meanwhile, Malaysia was scored top 20 investor-friendly destinations for period between 2014 -2018 in the Economist Intelligence Unit's 2014 Business Environment Rankings.

With the customer base of 620 million young people, manufacturers need to format strategic action plan that fulfilling the true potential of changing global economy condition. It is very challenging for Malaysian manufacturers to tackle whatever issues or weaknesses that occur by having new approaches to address new and existing challenges. To support Malaysia continues to move towards high-value and knowledge based economy, technology and innovation capabilities crucial to raise the overall efficiency.

Therefore, this paper focuses the influence of technology and innovation in new product development. It is essential that organization to take their products to next level, transforming it to be better suited for today's fast paced and competitive world. New Product development is the process that brings together all the people involved and sharing a common vision.

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